PTO

Method and Apparatus For Drilling

The present invention relates to a method for drilling in which tubulars can be added or removed from a drill string whilst the mud is circulating and to apparatus which enables this be carried out.

It is well known in the drilling industry, and particularly in the filed of drilling for oil, natural gas and other hydrocarbons, that drill strings comprise a large plurality of tubular sections, hereinafter referred to as "tubulars", which are connected by male threads on the pins and female threads in the boxes. It is also well known that such tubulars must be added to the drill string, one-by-one, or in "stands" of 2 or 3 connected tubulars, as the string carrying the drill bit drills into the ground, a mile or more below ground being common in the oil drilling art. For various reasons during the drilling, and after the borehole has been drilled, it is necessary to withdraw the drill string, in whole or in part. Again, each tubular or stand must be unscrewed, one-by-one, as the drill string is brought up to the extent required.

With prior art systems, each time that a tubular is added or removed, it is necessary to stop the drilling process and the circulation of drilling fluid. This presents a costly delay in the overall drilling operation. This is because the circulation of drilling fluids is extremely critical to maintaining a steady down hole pressure and a steady and near constant Equivalent Circulating Density (ECD), as is well known in the drilling art. Also, as is well known, when tripping the drill string into or out of the well, the lack of continuous circulation of a drilling fluid causes pressure changes in the well which increases the probability of "kicks".

In addition to the drilling operation, the placement of casings in the [bare] <u>bore</u> hole is also necessary. As in the case of tubulars, the placement of casing sections in the prior art presents the same fundamental problems. That is, the flow of drilling fluids must be halted, and the drill string must be withdrawn in its entirety before the casing can be

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